

L Number	Hits	Search Text	DB	Time stamp
1	6	pattern adj density same (topographic)	USPAT; US-PGPUB	2002/12/23 10:18
2	0	pattern adj density same (topographic adj analysis)	USPAT; US-PGPUB	2002/12/23 10:18
3	6	pattern adj density same (topographic) and CMP	USPAT; US-PGPUB	2002/12/23 10:18
4	0	(pattern adj density same (topographic) and CMP) not (pattern adj density same (topographic))	USPAT; US-PGPUB	2002/12/23 10:18
5	2	(measuring with (pattern adj density)) same CMP	USPAT; US-PGPUB	2002/12/23 10:20
6	0	(measuring with (pattern adj density)) same CMP same composition	USPAT; US-PGPUB	2002/12/23 10:20
7	0	(measuring with (pattern adj density)) same CMP same composition	EPO; JPO; DERWENT; IBM_TDB	2002/12/23 10:21
8	0	(measuring with (pattern adj density)) same CMP and (composition same CMP)	USPAT; US-PGPUB	2002/12/23 10:22
9	26	(pattern adj density) same CMP and (composition same CMP)	USPAT; US-PGPUB	2002/12/23 10:23
10	24	((pattern adj density) same CMP and (composition same CMP)) not (pattern adj density same (topographic))	USPAT; US-PGPUB	2002/12/23 10:23
11	24	((pattern adj density) same CMP and (composition same CMP)) not (pattern adj density same (topographic)) not (pattern adj density same (topographic) and CMP)	USPAT; US-PGPUB	2002/12/23 10:24

L Number	Hits	Search Text	DB	Time stamp
1	2332	438/692-695.ccls.	USPAT; US-PGPUB	2002/12/23 14:08
2	646	438/692-695.ccls. and polish\$3 with time	USPAT; US-PGPUB	2002/12/23 13:36
3	502	(438/692-695.ccls. and polish\$3 with time) and thickness	USPAT; US-PGPUB	2002/12/23 13:36

US-PAT-NO: 6351723

DOCUMENT-IDENTIFIER: US 6351723 B1

TITLE: Failure diagnostic method and apparatus for
equipment and recording
medium in which program causing computer system to execute
process in
accordance with such method is stored

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In addition, the current and the voltage supplied to a vacuum pump motor, a wafer changing motor, a stage motor, a belt driving motor and a CMP driving motor used in the semiconductor manufacturing equipment, such as a low pressure CVD apparatus, a atmospheric pressure CVD apparatus, a diffusion apparatus, an exposure apparatus, a sputter apparatus, an I I apparatus, an etching apparatus, a testing apparatus, a pre-processing apparatus, a CMP apparatus and a coat/development apparatus, are used as the operating state parameters used to calculate the value of the deviation process capability (the Cpk value).
The vibration (converted into a voltage value) of a wafer holding block and a pump used in the semiconductor manufacturing equipment may also be used as the operating state parameter to calculate the deviation process capability (the Cpk value).

US-PAT-NO: 6186877

DOCUMENT-IDENTIFIER: US 6186877 B1

TITLE: Multi-wafer polishing tool

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Conventionally, the chemical composition of the slurry is selected in order to adjust a removal rate according to the composition of a specific layer and features therein to be planarized. Apart from the chemical composition of the slurry provided to the CMP tool, two mechanical parameters play a critical role in determining the removal rate. These are the rotational velocity between the wafer and the polishing pad, and the downforce applied to press the wafer against the polishing pad. An increase in either the rotational velocity or the downforce results in a higher removal rate. Conversely, a decrease in the rotational velocity or the downforce results in a lower removal rate.

At conventional platen rotational velocities of 10 to 140 rpm, a force of at least 5 and up to 9 psi must be applied by a wafer carrier 116 to press the wafer towards the platen 118 ("downforce") in order to perform CMP to attain even a marginal wafer processing rate. The application of a downforce of 5 to 9 psi is not uncommon to achieve desirable process throughput. A known consequence of high downforce at the wafer/platen interface is a tendency for differentials in the removal rates of different composition features to increase. Higher downforce results in increased dishing of metal features

within an oxide layer, and ultimately reduced planarity
when polishing layers
which contain features of different composition or pattern
density.